



Science / Electronics

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Universal Baths - SUB Series

Unstirred Baths - JB/PY Series

Boiling Baths - SBB Series

User Manual

User Manual for Unstirred Baths, Universal Baths, and Boiling Baths

Universal Baths

SUB6	6 liter
SUB14	14 liter
SUB28	28 liter
SUB36	36 Liter

Unstirred Baths

JB1/PY1	3.5 liter
JB2/PY2	10 liter
JB4/PY4	16 liter
JB5/PY5	24 liter

Boiling Baths

SBB6	6 liter
SBB14	14 liter
SBB28	28 liter

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1. SAFETY

The following symbols marked on the equipment mean:




Caution: Read these operating instructions fully before use and pay particular attention to sections containing this symbol

- ◆ Caution: Surfaces can become hot during use.
- ◆ Always observe the following safety precautions:



Use only as specified by the operating instructions or the intrinsic protection may be impaired.

- ◆ After transport or storage in humid conditions, dry out the unit before connecting it to the supply voltage. During drying out the intrinsic protection may be impaired.
 - ◆ Connect only to a power supply with a voltage corresponding to that on the serial number label.
 - ◆ Connect only to a power supply which provides a safety ground terminal.
 - ◆ Before moving, disconnect at the power supply socket. Do not remove the plug.
 - ◆ Do not check the temperature by touch, use the temperature display or a thermometer.
 - ◆ To reduce the risk of eye injury during high temperature operation, use safety goggles or spectacles.
 - ◆ Do not touch surfaces which become hot during high temperature operation.
 - ◆ Ensure that the operating temperature is less than the maximum operating temperature of your sample material.
-  Set the adjustable overtemperature cut-out (where applicable) after setting or changing the set temperature, and reset it at monthly intervals to check that the cut-out is operating correctly.
- ◆ Ensure that the power switch is easily accessible during use.
 - ◆ Do not block or restrict ventilation slots.
 - ◆ These baths are for use only with water.
 - ◆ If liquid is spilled inside the unit, disconnect it from the power supply and have it checked by a competent person.
 - ◆ It is the user's responsibility to carry out appropriate decontamination if hazardous material is spilled on or inside the equipment.
 - ◆ Do not connect to a power supply or switch on before filling the tank.

- ◆ Take care when topping up or draining, as the liquid in the tank may be very hot or cold.
- ◆ If the alarm lamp is illuminated do not touch the liquid or the heater, they may be very hot. Refill carefully, a hot heater can cause a spattering of very hot water droplets and scalding steam.
- ◆ Always use a lid or polypropylene spheres when operating above 60 °C. Take care when raising and removing the lid, it may be hot. Steam and hot vapors can cause scalding.
- ◆ Drain before moving the bath. Before draining allow the liquid to cool to below 50 °C or heat to above 10 °C.

2. ASSEMBLY

2.1 Unpacking

Remove packing materials carefully, and retain for future shipment or storage of the unit. Packs should contain:

Universal Bath (SUB Series)

Power Line Cord

Operating Instructions

Unstirred Bath (JB/PY Series)

Perforated Tray

Operating instructions

Boiling Bath (SBB Series)

Perforated Tray

Operating Instructions

Power Line Cord

2.2 Installation

2.2.1 Universal Baths

Fit the power line cord into the A/C power socket on the rear of the unit.

Fill the bath with water. The minimum depth is 50mm above the base of the tank and the maximum level is 30mm from top of the tank when bath is fully loaded. A lid or layer of polypropylene spheres must be used with baths above 60 °C.

2.2.1.1 Adjustable overtemperature cut-out

Before switching the Universal Baths on for the first time, using a screwdriver through the hole in the **set overtemperature** knob, turn the set overtemperature control fully clockwise and press. Plug in and switch on power to the unit.

2.2.2 Boiling Baths

Fit the power line cord into the A/C power socket on the rear of the unit.

Fill the bath with water. The minimum depth is 50mm above the base of the tank and the maximum level is 30mm from top of the tank when bath is fully loaded. A lid or layer of polypropylene spheres must be used with baths above 60 °C.

2.2.2.1 Constant level device

A constant level device is fitted to the BOILING BATH to maintain the required water level. To use the constant level device, connect the inlet pipe (black) to a water supply and the outlet pipe (white) to a drain. The level can be adjusted by loosening the white nut and raising or lowering the white tube. The position of the top of the tube determines the water level. Retighten the white nut. After filling the bath, adjust the water flow rate to the minimum which maintains a constant water

level when the water is boiling. If connecting to a mains water supply, check that local water supply regulations are complied with.

Plug in and switch on power to the unit.

2.2.3 Unstirred Baths

Fill the bath with water. The minimum level is 10mm above the top of the perforated tray and the maximum level is 40 mm from the top when bath is fully loaded. A lid or layer of polypropylene spheres must be used with baths above 60 °C. Plug in and switch on power to the unit.

3. OPERATION

3.1 Universal Baths (Models SUB6, SUB14, SUB28, SUB36)

3.1.1 Controls and Indicator lamps (see figure 1)

The temperature display normally shows the water temperature in degrees Celsius.

The **set temperature** °C (blue knob) sets the required operating temperature.

The **display set temperature** °C (gray button) shows set temperature when pressed.

The heater lamp (orange) indicates when the heater is on.

The heater lamp is on continuously while the water is heating up. As the required temperature is approached, it starts to flash. When the unit is controlling at set temperature, the heater lamp flashes intermittently.

Alarm lamp (red) illuminates when the overtemperature cut-out has operated

The **set overtemperature** control sets the operating point of the overtemperature cut-out.

The cut-out operates if the bath temperature rises above the temperature at which the cut-out is set. When it has operated, the red alarm lamp illuminates and the heater is switched off. The temperature continues to be displayed to warn of possible high temperatures.

3.1.2 Setting the temperature

The display normally shows the water temperature. To show the set temperature at any time press the gray **display set °C button**. To set the required operating temperature, push the gray **display set °C button**, while turning the **blue set temperature** °C knob until the required temperature is indicated on the display.

3.1.3 Setting the overtemperature cut-out

To protect both the unit and your samples, the overtemperature cut-out should be set each time the required operating temperature is changed. Using a screwdriver, adjustment is via the hole in the blue **push to reset** knob. Turn the cut-out fully clockwise, and press the blue knob to reset. The cutout is now set at its maximum. Allow the bath to stabilize at the required operating temperature. Turn the cut-out slowly counter clockwise using the screwdriver until the red alarm lamp comes on. Press the outer knob to reset and slowly turn the cut-out clockwise until the alarm lamp goes out. Turn the cut-out counter clockwise three quarters of the way back toward the point where the alarm lamp came on. The overtemperature cut-out is now set approximately 10 °C above the required operating temperature.

Note: If the required operating temperature is above 95 °C turn the control fully clockwise

3.1.4 Resetting the overtemperature cut-out

If the overtemperature cut-out has operated, the bath needs to cool to below the set temperature before the cut-out can be reset. Reset by pushing the blue outer knob.

3.2 Boiling Baths (Models SBB6, SBB14, SBB28)

3.2.1 Controls and Indicator lamps (see figure 2)

The set heater power knob controls the power of the heater through an energy regulator. It is not a thermostat

For heat up, turn the set heater power knob to maximum. Once the water is boiling, turn the knob to the minimum position which will maintain boiling.

The heater lamp (orange) indicates when the heater is on

3.2.2 Overtemperature protector

Two fixed overtemperature cut-outs prevent the heater from reaching a high temperature in the case of low liquid level.

The reset buttons for the cut-outs are on the rear panel.

3.3 Unstirred Baths (Models JB1/PY1, JB2/PY2, JB4/PY4, JB5/PY5)

3.3.1 Controls and indicator lamps (see figure 3)

The power lamp indicates when the unit is plugged into the power supply and is on.

The set temperature knob sets the required operating temperature.

The heater lamp (orange) indicates when the heater is on.

3.3.2 Over temperature protection

The JB1/PY1 unit is protected against overtemperature by an internal thermal fuse. The larger Unstirred Baths are protected by a fixed overtemperature cut-out.

If the heater lamp does not come on when expected and the temperature of the bath does not rise, see fault diagnosis (section 5).

4. ACCESSORIES

4.1 Individual racks for test tubes and universal bottles

Test Tube Size	Tubes per Rack		Model Numbers
	J2	J3	
10mm	84	102	J2-10; J3-10
13mm	55	70	J2-13; J3-13
16mm	36	44	J2-16; J3-16
19mm	32	40	J2-19; J3-19
25mm	18	24	J2-25; J3-25
30mm	12	20	J2-30; J3-30

Racks Per Bath		
	J2	J3
SUB6	1	--
SUB14	2	2
SUB28	4	4
SUB36	6	6
JB1/PY1	1	1
JB2/PY2	4	2
JB4/PY4	3	2
JB5/PY5	4	4

4.2 Lids and covers

4.2.1 Gabled lids

Gabled lids direct condensate away from vessels in the bath. They help to reduce evaporation, and to avoid contamination of samples.

Bath	Gabled lid
SUB6	LU6
SUB14	LU14
SUB28	LU28
SUB36	LU36
JB1/PY1	LJI
JB2/PY2	LJ2
JB4/PY4	LJ4
JB5/PY5	LJ5

A gabled lid pack contains:

- Cover
- Handle
- 2 adapters
- 2 screws

Assembly instructions: Remove the protective film from the lid. Pass two screws through the holes in the lid. Thread the adapters on to the screws, so that the 'v' cut fits over the ridge of the lid. Hold the handle in position against the adapters and fasten to the lid by tightening the screws.

4.2.2 Flat lids with holes

Flat lids have holes 105 mm diameter. Ring sets give alternative hole diameters of 78, 59, 43 and 31 mm to accommodate tall vessels. Flat lids minimize evaporation and heat loss, while accommodating tall flasks.

Bath	Flat lid	Ring Sets
SUB6/SBB6	LF6	2
SUB14/SBB14	LF14	4
SUB28/SBB28	LF28	6
SUB36	LF36	8
JB2/PY2	LF2	6

A flat lid pack contains:

Cover

Set of Rings

4.3 Polypropylene spheres (PS20)

Polypropylene spheres are an alternative to a lid; they minimize evaporation and heat loss, allow easy access to vessels in the bath, and they are particularly useful for tall vessels. One package contains approximately 300 spheres.

Bath	Spheres required
SUB6/SBB6	1 x PS20
SUB14/SBB14	1 x PS20
SUB28/SBB28	2 x PS20
SUB36	3 x PS20
JB1/PY1	1 x PS20
JB2/PY2	1 x PS20
JB4/PY4	1 x PS20
JB5/PY5	2 x PS20

4.4 Raised shelves for Universal and Boiling Baths

Raised shelves alter the effective liquid depth of half the bath to accommodate different shapes and sizes of vessel simultaneously. Each shelf provides two alternative depths. You can use more than one shelf per bath to achieve a range of depths. The raised shelves can be used either side up in the bath to give different liquid depths. The liquid depth can be set by changing the amount of liquid in the bath

RS14H covers half the area of SUB14/SBB14

RS28H covers half the area of SUB28/SBB28

RS36H covers half the area of SUB36

4.5 Siphon SYI

Use for draining baths.

5. FAULT DIAGNOSIS

Symptom	Possible Cause	Action required
Unit does not operate	Unit not switched on	Switch on
	Unit not plugged into power supply	Plug in, switch on
	Power supply failure	Check that other electrical appliances on the same circuit are working
Universal Bath alarm lamp on or SBB Bath heater lamp does not come on	Over temperature cut-out has operated	Reset cut-out and check its setting as described in 3.1.3 and 3.1.4.
		Check water level. If the cut-out operates again or cannot be reset, have the unit checked by a technician
Temperature does not rise when expected	Set temperature is lower than liquid temperature (not SUB Baths)	Check set temperature
	JB1/PY1 thermal fuse has operated	Have fuse replaced by competent person
	JB2/PY2,JB4/PY4,JB5/PY5 overtemperature cut-out has operated	Check water level. Have cut-out reset by a technician. See section 7.2.2
	SBB boiling bath over temperature cut-out has operated	Reset cut-outs
	Temperature control circuit fault (not SBB boiling baths)	Have unit checked by a technician
Temperature continues to rise when not expected (not SBB boiling bath)	Set temperature is higher than water temperature	Check setting
	Temperature control circuit fault	Have unit checked by a technician

6. TECHNICAL SPECIFICATIONS

This equipment is for indoor use and will meet its performance figures within the ambient temperature range 10° C to 35 °C, with maximum relative humidity of 80% non-condensing. Installation category II (transient voltages). Pollution degree 2 in accordance with IEC 664. For operation at altitudes of up to 2000 meters.

6.1 Universal Baths (SUB Series)

Temperature range:	(Ambient +5 °C) to 99 °C
Setting range:	15 °C to 99 °C
Stability at 37 °C:	± 0.2 °C
Uniformity at 37 °C:	± 0.2 °C
Temperature display resolution:	1 °C
Supply voltage range:	110-120V: 50/60Hz

Power Rating	SUB6	350W
	SUB14	700W
	SUB28	1300W
	SUB38	1300W

Overtemperature protection: Adjustable, resettable safety cut-out

Heat-up rate (ambient to max)	
SUB6	90 min
SUB14, SUB28, SUB38	80 min

6.2 Boiling Bath units (SBB Series)

Temperature range:	100 ° C only
Supply voltage range:	110-120V 50/60Hz
Power rating:	SBB6 1300 W
	SBB14 1350 W
	SBB28 1350 W

Overtemperature protection: Two resettable fixed temperature cut-outs
Constant level device which maintains the required liquid level.

6.3 JB/PY Bath units

Temperature range:	(Ambient + 5 °C) to 90 °C
Setting range:	20 to 90 °C
Stability at 37 °C	± 0.3 °C
Supply voltage range:	110/120V 50/60Hz
Power rating:	JB1/PY1 300 W
	JB2/PY2 750 W
	JB4/PY4 750 W
	JB5/PY5 1350 W

Overtemperature protection	
JB1/PY1	Thermal fuse
JB2, JB4, JB5	Resettable fixed temperature cut-out
PY2, PY4, PY5	Resettable fixed temperature cut-out

7. MAINTENANCE AND SERVICE

All Science/Electronics laboratory products are designed to comply with IEC1010-1 and can be flash tested. Some are fitted with radio frequency interference suppressors. Therefore it is recommended that only a d.c. test be performed.

Universal Baths only (SUB series):

The overtemperature cut-out should be checked periodically by turning the set overtemperature control counter clockwise until the alarm lamp comes on. The cut-out should then be reset and set-up (see 3.1.3). If the alarm lamp fails to light with the knob turned fully counter clockwise the unit should be checked by a technician.

No other routine maintenance is required.

7.1 Cleaning

The outer casings can be cleaned with a damp cloth after disconnection. Do not use solvents. The immersed parts can be cleaned using proprietary heating element cleaners. CAUTION: these may be toxic - follow the cleaner manufacturer's instructions.

Before using any decontamination or cleaning method not recommended, check with our Service Department to ensure that the proposed method will not damage the equipment

7.2 Replacement of Fuses

7.2.1 Universal (SUB Series) and Boiling Bath (SBB Series)

Empty the bath. Disconnect the unit from the power supply. Remove the plug from the socket in the back of the bath. Press down the fuse drawer catch. Pull out the fuse drawer. Check and replace with the correct fuses if necessary. The fuses should be 1.25 x 0.25 inch quick acting, rated: 250V

SUB6	5AF
SUB14	10AF
SUB28	15AF
SUB36	15AF

SBB6	15AF
SBB14	15AF
SBB28	15AF

Push back the drawer, and replace the plug.

7.2.2 Unstirred Baths

The fuse is accessible under the base cover. This should only be replaced by a technician. The fuses should be 1.25 x 0.25 inch ceramic quick acting, rated: 250V

JB1/PY1	5AF
JB2/PY2	10AF
JB4/PY4	10AF
JB5/PY5	20AF

7.3 Resetting the overtemperature cut-out

On JB2/PY2, JB4/PY4 and JB5/PY5 baths the overtemperature cut-out is accessible under the base cover. This should only be reset by a competent person.

On the JB1/PY1 the overtemperature cut-out is accessible under the top cover. This should only be reset by a competent person.

8. WARRANTY

When used in laboratory conditions and according to these operating instructions, these baths are warranted for THREE YEARS against faulty materials or workmanship.

9. SERVICE

It is necessary that a Returned Material Authorization (RMA) number and form be obtained before return of any Science/Electronics product for any reason. Contact us for more information. Please be sure to mark the outside of the returned goods package with this RMA number to ensure prompt handling.

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Figure 1. Controls - Universal Bath Series

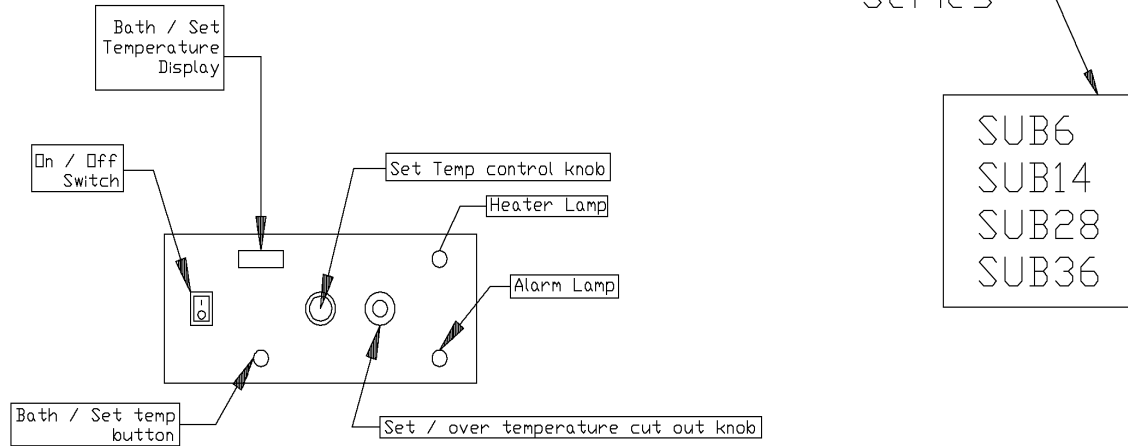


Figure 2. Controls - Boiling Bath Series

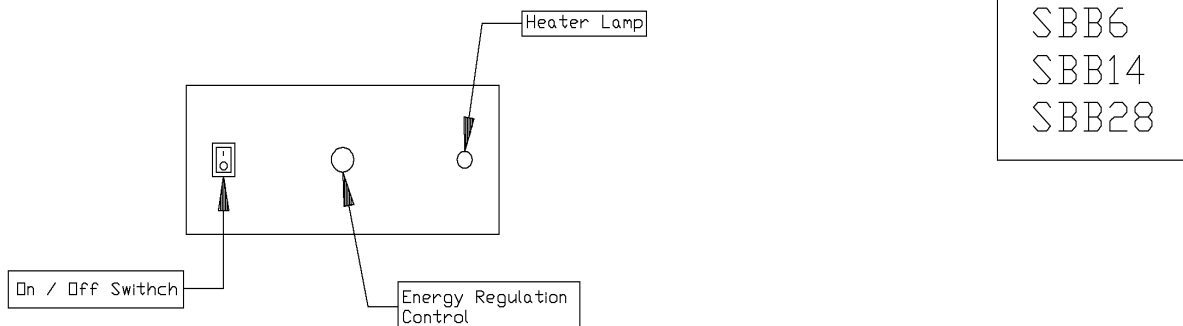


Figure 3. Controls - Unstirred Bath Series

